

CLAIMS:

1. Apparatus for processing articles comprising
movable parts for processing said articles,
a plurality of microcontroller boards secured to said
apparatus,
5 said microcontroller boards having a plurality of logic chips
secured thereto,
sensors for monitoring operation of said apparatus and
providing input information regarding a plurality of monitored conditions to said
microcontroller boards,
10 said microcontroller boards being structured to process said
input information and emitting responsive control signals to other said
microcontroller boards and control portions of said apparatus, and
communication means for effecting communication (a)
between said sensors and said microcontroller boards, (b) among said
15 microcontroller boards and (c) between said microcontroller boards and control
portions of said apparatus, whereby said microcontroller boards will through receipt
and processing of said input information for a plurality of monitored conditions and
communicating with other said microcontroller boards effect control of a plurality of
monitored apparatus conditions.
2. The apparatus of claim 1 including
said microcontroller boards having means for emitting control
signals responsive to receipt of information from said sensors.
3. The apparatus of claim 2 including
said microcontroller boards being secured to a movable or
stationary portion of apparatus or both.
4. The apparatus of claim 1 wherein
said processing includes creating said articles from
workpieces.

5. The apparatus of claim 4 including
said microcontroller boards being embedded within said apparatus.
6. The apparatus of claim 1 including
said communication means having means for effecting communication within said microcontroller boards.
7. The apparatus of claim 6 including
said communication means having means for effecting communication with other portions of said apparatus.
8. The apparatus of claim 1 including
said microcontroller boards being disposed within a container.
9. The apparatus of claim 1 including
a container disposed within a recess in said apparatus,
said microcontroller boards being disposed within said container, and
a sealing material covering said microcontroller boards.
10. The apparatus of claim 9 including
said sealing material being an epoxy which substantially completely covers said logic chips, whereby removal of said epoxy will at least partially destroy said logic chips.
11. The apparatus of claim 1 including
a display unit for displaying information regarding said apparatus, and
said display unit being operatively associated with said communication means.
12. The apparatus of claim 2 including
said communication means having a component which receives feedback from said sensors and delivers responsive signals to at least one said microcontroller board.
13. The apparatus of claim 12 including
said microcontroller boards being structured to deliver control signals to other portions of said apparatus to effect a change therein.

14. The apparatus of claim 1 including calibration means disposed exteriorly of said microcontroller boards for providing information to said communication means prior to initiating operation of said apparatus.
15. The apparatus of claim 1 including said logic chips being disposed on both surfaces of at least one said microcontroller board.
16. The apparatus of claim 2 including at least one container having at least one said microcontroller board disposed therein, and said container disposed at least partially within a recess in said apparatus.
17. The apparatus of claim 16 including a resinous material encapsulating each said microcontroller board.
18. The apparatus of claim 16 including said containers having only one said microcontroller board therein.
19. The apparatus of claim 16 including said containers having a plurality of said microcontroller boards therein.
20. The apparatus of claim 16 including at least two said containers.
21. The apparatus of claim 20 including at least some of said containers having a plurality of said microprocessor boards.
22. The apparatus of claim 17 including said resinous material being epoxy.
23. The apparatus of claim 4 including said workpieces being metal sheet stock.
24. The apparatus of claim 1 including said processing including handling of pre-formed articles.
25. The apparatus of claim 1 including

- said processing including inspection of said articles.
26. The apparatus of claim 1 including
said processing includes packaging of said articles.
 27. The apparatus of claim 4 including
said articles include at least one article selected from the
group consisting of semi-fabricated products and fabricated products.
 28. The apparatus of claim 1 including
a container having at least one said microcontroller board
disposed therein, and
at least one said sensor disposed within said container.
 29. The apparatus of claim 28 including
a plurality of said microcontroller boards disposed within said
container.
 30. The apparatus of claim 28 including
said container secured to said apparatus.
 31. The apparatus of claim 28 including
said container disposed within a recess within said apparatus.
 32. The apparatus of claim 1 including
said apparatus being portable apparatus.
 33. The apparatus of claim 1 including
a plurality of microprocessor modules each containing a
plurality of said microcontroller boards and being operatively associated with at
least some said sensors and at least a portion of said communication means.
 34. The apparatus of claim 33 including
said microprocessor modules being secured to different
portions of said apparatus and at least some of them being structured to perform
different functions than others of said microprocessor boards.
 35. A method of processing articles comprising
providing an apparatus having cooperating movable parts for
processing said articles,

providing a plurality of microcontroller boards each having a plurality of logic chips secured to said apparatus,

sensing certain conditions of said apparatus or said articles and delivering input information regarding a plurality of monitored conditions from ~~said~~ sensors to said microcontroller boards, and

5 responsive to receipt of said input information from said sensors, said microcontroller boards processing said input information and emitting responsive control signals from said microcontroller boards to other said microcontroller boards and portions of said apparatus to control operation of said apparatus, whereby said microcontroller boards processing of said input information for a plurality of monitored conditions and communicating with other said microcontroller boards effect control of a plurality of monitored apparatus conditions.

36. The method of claim 35 including
employing a plurality of said microcontroller boards.

37. The method of claim 36 including
providing said microcontroller boards in a recess in said
apparatus.

38. The method of claim 36 including
displaying visually readable information regarding specific
conditions of said apparatus.

39. The method of claim 35 including
employing as a microprocessor module a container having at
least one said microcontroller board disposed therein, and serving said container to
said apparatus.

40. The method of claim 39 including
encapsulating said microcontroller boards with a resinous
material.

41. The method of claim 39 including
employing only one said microcontroller board in each said
container.

42. The method of claim 39 including

employing a plurality of said microcontroller boards in at least some of said containers.

43. The method of claim 39 including employing a total of at least two said containers, and said containers being disposed within recesses in said apparatus.

44. The method of claim 43 including providing at least some of said containers with a plurality of said microprocessor boards.

45. The method of claim 40 including employing epoxy as said resinous material.

46. The method of claim 35 including said processing including manufacturing or partially manufacturing said articles.

47. The method of claim 46 including manufacturing said articles from workpieces.

48. The method of claim 47 including employing metal sheet stock as said workpieces.

49. The method of claim 35 including said processing including inspection.

50. The method of claim 35 including said processing including transporting and subsequently packaging said articles.

51. The method of claim 35 including providing a container within which a plurality of said microcontroller boards and at least one sensor performing a condition sensing are disposed.

53. The method of claim 35 including securing a plurality of said microprocessor board and sensor containers to said apparatus.

54. The method of claim 52 including

employing at least some of said microprocessor board and sensor containers to perform different functions than others.

55. The method of claim 54 including securing said containers to said apparatus.
56. The method of claim 55 including at least some of said containers being secured within recesses in said apparatus.
57. The method of claim 35 including employing portable apparatus as said apparatus.
58. The method of claim 35 including said processing including transport of said articles.
59. The method of claim 35 including said processing including at least one segment involved in an industrial manufacturing process.
60. The method of claim 35 including employing at least one actuator responsive to said control signals from said microcontroller serving to alter a condition of said apparatus.
61. The method of claim 39 including a said microprocessor module being operatively associated with a plurality of said sensors
62. The method of claim 39 including a said microprocessor module being operatively associated with a plurality of actuators for altering said apparatus or said article responsive to control signals received from said microprocessor module.
63. The method of claim 35 including employing as said articles at least one item selected from the group consisting of semi-fabricated or fabricated articles.
64. The method of claim 35 including said processing including counting of said articles.